

# 7.2 WAITAKI RESTORATION

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Restoring wetlands: rūnanga implementation of an integrated aquatic restoration programme across multiple spatial scales

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Understanding the cultural context and delivering cultural opportunities

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Determining the range of initiatives needed to deliver outcomes sought by whānau

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Monitoring, reporting, and communicating restoration success

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Summary

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# RESTORING WETLANDS: RŪNANGA IMPLEMENTATION OF AN INTEGRATED AQUATIC RESTORATION PROGRAMME ACROSS MULTIPLE SPATIAL SCALES

## Background

The impetus for this case study was concern that, over the last 150 years, the takiwā (region) of one rūnanga (iwi authority) in the South Island of Aotearoa New Zealand has been altered and degraded by resource use and development. The focus area is the North Otago region and the Waitaki district in particular. To Ngāi Tahu, the Waitaki River is sourced from a stream known as Ngā Roimata o Aoraki (the "Tears of Aoraki") that feeds into Lake Pūkaki. The catchments of interest lie in the takiwā of Te Rūnanga o Moeraki, which is one of the 18 papatipu rūnanga (authority of Ngāi Tahu people over the land, sea, and natural resources) as defined

in the Te Rūnanga o Ngāi Tahu Act 1996. The takiwā extends over a large spatial area, from the Waitaki River in the north to the Waihemo River as its southern boundary and inland to the Southern Alps. The marae (meeting house) is located in Moeraki township.

Although Ngāi Tahu were active in a number of resource management forums and had multiple initiatives underway, the issue was the extent to which these initiatives effectively informed and shaped contemporary resource management decisions. An integrative and strategic process that has been developed and trialled by rūnanga is shown in Figure 1. This process has two parallel streams:

- Understanding the cultural context – identifying the opportunities tangata whenua (indigenous people) want to see delivered in catchments to help direct targeted whānau (family) engagement in appropriate resource management forums
- Documenting the causes of changes being experienced by tangata whenua – examining the nature and extent (or scale) of alterations to valued environments, determining the consequent impact on whānau, and identifying the continuing threats to the state of the cultural landscape.

Previous page: Dewatered stream. Photo: Kyle Nelson



*Kia tuohu koutou, me he mauka teitei, ko Aoraki anake; If you must bow your head, then let it be to the lofty mountain Aoraki. Looking across the waters of Lake Pūkaki towards Aoraki. Photo: Shutterstock 1251638*

# UNDERSTANDING THE CULTURAL CONTEXT AND DELIVERING CULTURAL OPPORTUNITIES

## Values and aspirations

The development of the integrated planning framework started with the articulation by whānau members of the linkages between cultural values and the principles of restoration. This articulation sets a high level strategic direction. Once completed, it was then a straightforward task to map the aspirations of whānau, which is a spatial depiction of their vision for the catchment. For example, Figure 2 details some of the aspirations whānau have for the Waitaki River catchment.

Once the opportunities sought by whānau were mapped we focused the analysis on particular values. For example, mahinga kai (food gathering sites) is a value that lies at the heart of Ngāi Tahu culture and identity. From historic records we know that of more than 30 species, over half were freshwater fish species, with the remainder a mix of plants, birds, and marine species gathered across 160 sites in the Waitaki catchment. Approximately 70% of the sites in the Waitaki sustained tuna (freshwater eels), which was the most commonly gathered food source. Tuna remain a taonga (treasure) that whānau want to see restored at sites across the catchment (Figure 3). Understanding the significance of a species to tangata whenua and its historic range, ki uta ki tai (from the mountains to the sea), enables the identification of potential sites to be restored and where a species could be reintroduced.

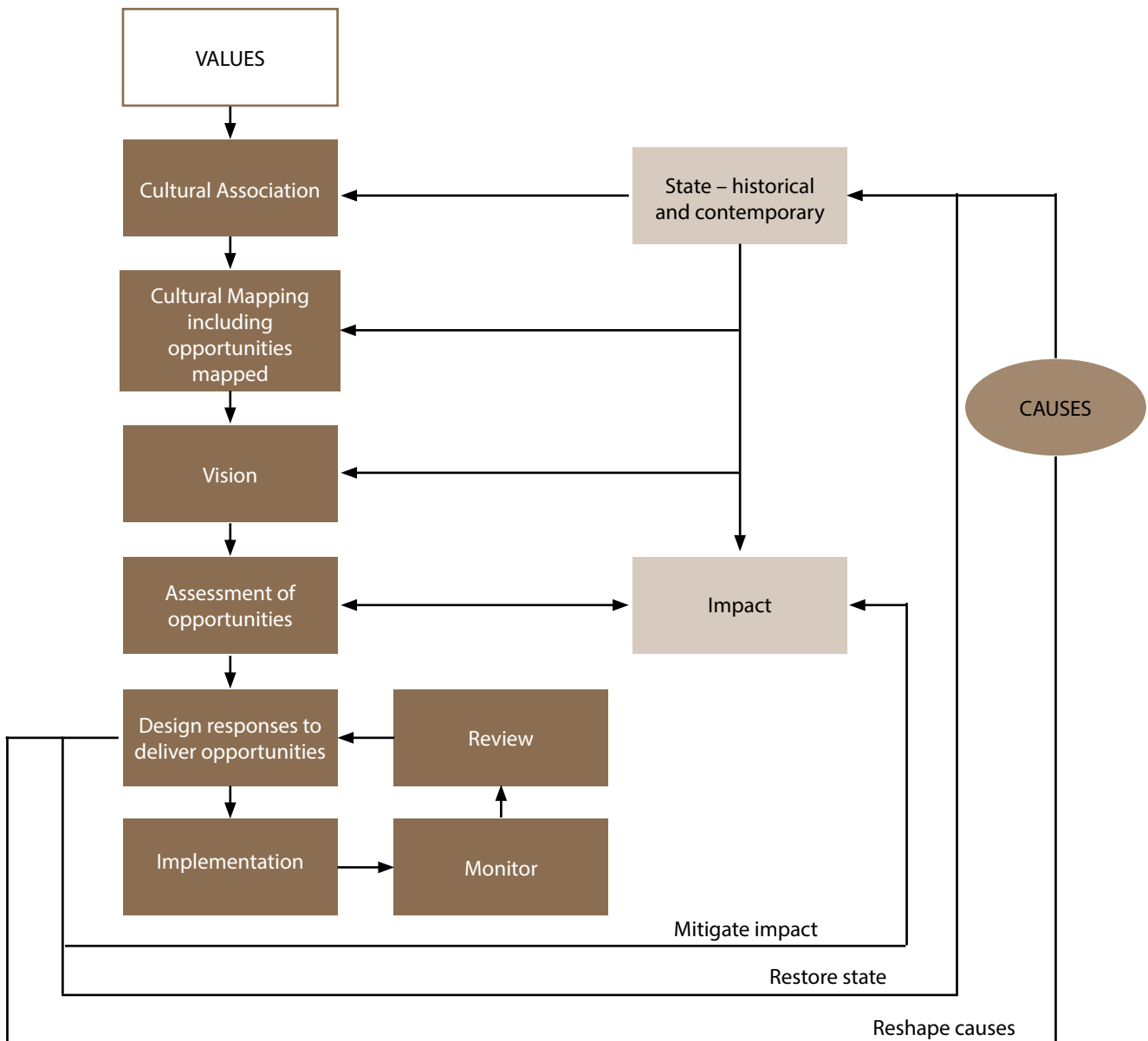


Figure 1. An integrative planning framework developed by tangata whenua to strategically inform aquatic restoration efforts

<p><b>OVERALL</b></p> <ul style="list-style-type: none"> <li>• <b>To protect the mauri (life force) of the Waitaki catchment</b></li> <li>• <b>Implement a co-governance regime for the Waitaki catchment</b></li> </ul>	<ul style="list-style-type: none"> <li>• Improve access</li> <li>• Protect rock art</li> <li>• Provide services at nohoanga (dwelling place)</li> <li>• Secure role in monitoring, compliance, and enforcement</li> <li>• Implement native fish reserves</li> </ul>	<ul style="list-style-type: none"> <li>• Implement at least 1 economic development opportunity</li> <li>• Develop a mahinga kai centre</li> <li>• Restore and enhance taonga species (native plants and animals of cultural significance)</li> <li>• Hold all tuna quota</li> </ul>
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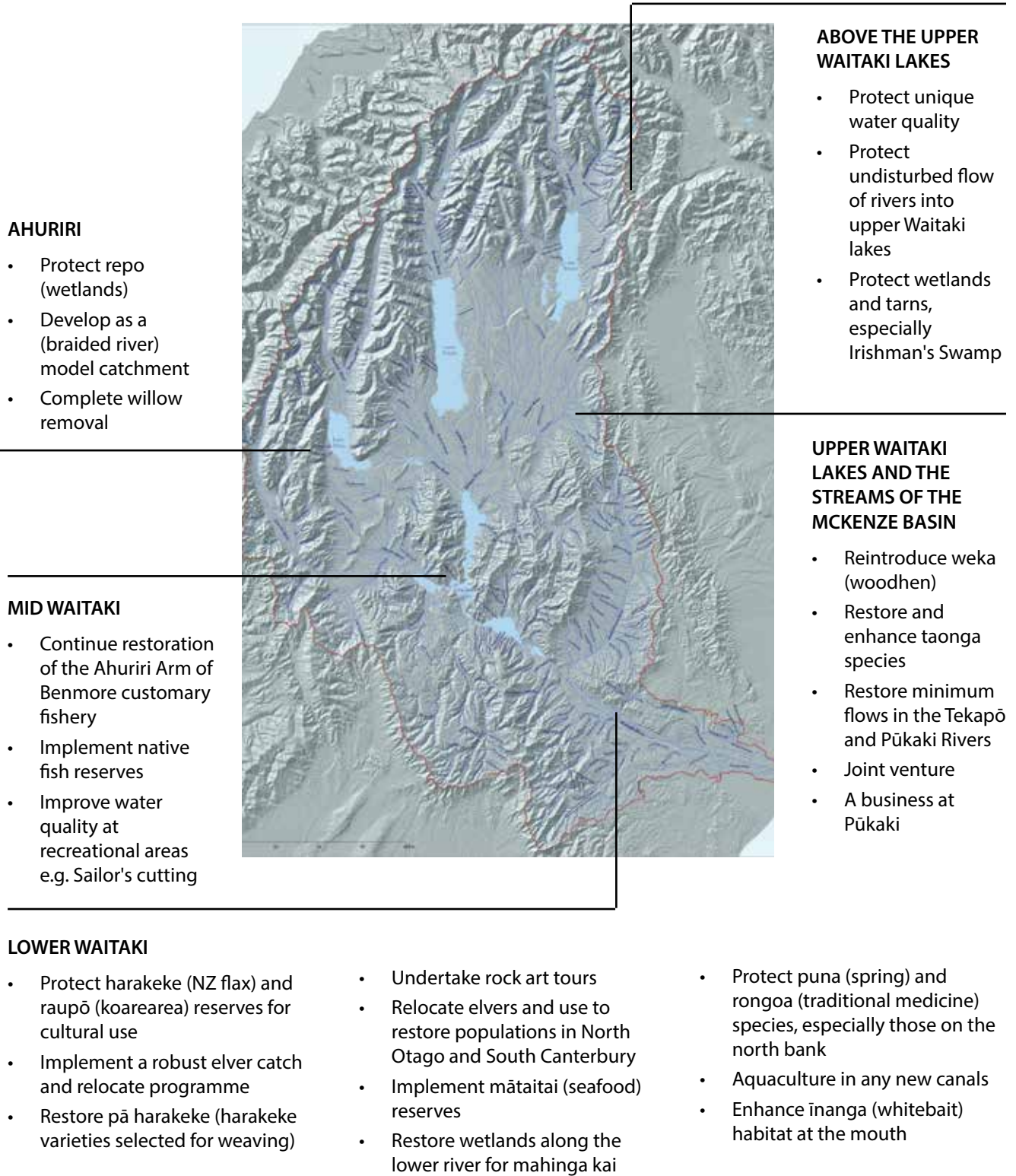


Figure 2. Whānau aspirations for the restoration of the Waitaki River catchment (from Tipa 2014)

### Impacts, threats, and changes experienced by whānau

Understanding environmental changes, their impacts, and ongoing threats is a prerequisite to moving to proactive engagement in aquatic restoration. The changes and impacts identified by whānau were also recorded and visualised on a timeline.

Wānanga (learning), hīkoi (walks) and hui (gatherings) provided opportunities for facilitated discussions to identify and examine the cultural impacts of these changes. Water was first expropriated in the 1800s as settlers claimed springs for their livestock and diverted flows to supply farms and towns. Fences to control livestock, European concepts of private land ownership, and the placement of reserves in the lower catchment in the 19th century all impacted on Ngāi Tahu access to mahinga kai and constrained the mobility on which their mahinga kai-based economy had depended.

Without doubt, one of the most significant changes in the Waitaki catchment has been the construction of the Waitaki Hydro Power Scheme, which consists of eight power stations from Lake Tekapō to Lake Waitaki. Meridian Energy owns and operates six of these stations from a control centre in Twizel, generating energy from water flowing from the Southern Alps out to the sea. Genesis Energy Ltd owns and manages the other two stations. In the last 20 years, land use change, in particular land use intensification, continues to have further significant impacts on the waterways of the Waitaki.

### Assessing impacts and cultural opportunities

Any assessment of the impacts, changes and the contemporary state of a catchment must be undertaken within the context of whānau aspirations for the takiwā. While the impacts experienced at a particular site can be quite localised, the environmental impacts on a particular taonga species need to take into account the life cycle and habitat requirements of that species, which may encompass a much broader spatial area. In the example used here, we engaged scientists to help assess biophysical impacts on the site and taonga species, while whānau members undertook cultural assessments. Figure 4 provides an example of the changes that whānau identified as having impacted a specific taonga species (in this case eels) and helps illustrate how direct impacts on tuna populations can have flow-on impacts on cultural landscapes, cultural practices, and ultimately the cultural wellbeing of whānau and hapū (subtribe).

A dewatered stream adjacent to a historic reserve granted to Ngāi Tahu in the 1860s. Photo: Kyle Nelson



Photo (right) shows a stream located next to a nohoanga created under the Ngai Tahu Claims Settlement Act 1998. Because of its significance to Ngāi Tahu is to be restored. There remain however sites of significance suffering from what whānau perceive to be inappropriate management (Photo previous page), while Figure 4 illustrates how the environmental impacts ultimately impact the wellbeing of whānau and hapū.



A site in the Willowburn, adjacent to a nohoanga that is to be part of the catchment restoration. Photo: Kyle Nelson

<sup>2</sup> Discover Waitaki. <https://www.meridianenergy.co.nz/assets/Uploads/Discover-Waitaki-Nov-15.pdf>

**VALUES**

**Ecological values include:**

- Top predator in the food chain
- Connectivity between marine and freshwater ecosystems
- Should be a large component of the freshwater fish biomass in areas without large natural barriers



**Economic values include:**

- Iwi-owned commercial tuna quota
- Important kai source for whānau and marae communities
- Tuna traded between whānau, hapū, and iwi



**Socio-cultural values include:**

- Important kai source for whānau and marae communities
- Education includes whakapapa (genealogy) of tuna, stories, practices of gathering and processing, species names
- Important in kaihaukai (tribal feast) and for exercising manaakitanga (hospitality)



**IMPACTS**

**Stressors include:**

- Declining water quality, decreasing water quantity, loss of habitat, loss of fish passage, loss of ecosystem connectivity over fishing

**Access impacts include:**

- Loss of physical access
- Legal impediments to access
- Loss of materials for harvest, e.g. constructing hīnaki (eel basket)

**Whānau health impacts include:**

- Not gathering and eating tuna
- Eating contaminated tuna

**Cultural impacts include:**

- Loss of tikanga (cultural practices)
- Loss of mātauranga (knowledge)
- Loss of te reo (language)

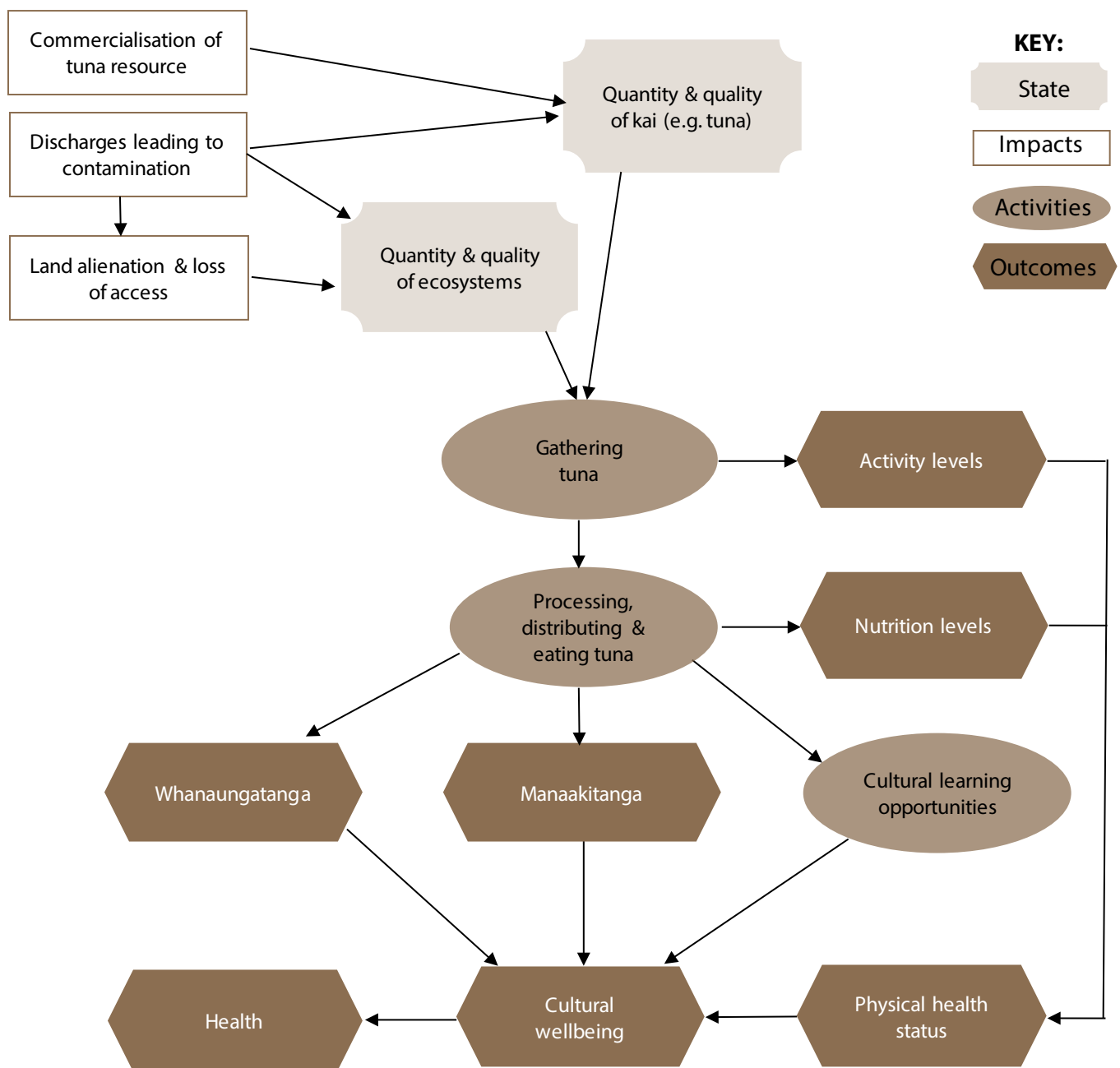
**Economic impacts include:**

- Cost of buying substitute foods
- Distance now necessary to travel to harvest tuna

**Figure 3. The value and significance of tuna (freshwater eels) as a mahinga kai and taonga species**

Photos: John Clayton and Erica Williams

Environmental and cultural assessments undertaken by whānau can utilise the outputs of the cultural mapping exercises, aerial photographs, and conceptual diagrams (e.g. Fig. 4). A variety of cultural assessment tools are currently in use by tangata whenua as it cannot be assumed a single assessment method will meet all whānau needs. The complexity of issues at a site mean a range of tools and assessments will be needed. Figure 5 shows the aspirations of whānau for a significant cultural landscape, Takiroa Wetland, in the Waitaki River catchment, where assessments have been undertaken by both biophysical scientists and Ngāi Tahu, who applied a Cultural Health Index.



**Figure 4. An illustration of the impacts of environmental change and mahinga kai and cultural wellbeing** (Tipa 2011, adapted from Donatuto 2008)

## FRANCIS PROPERTY (TAKIROA)

### Description

Many taonga including:

- Spring-fed channels and swamp. Modified, but good ecological values; large stands of harakeke (uncommon in valley) and pūrei (carex) common. Watercress and other macrophytes abundant in channels. Recent restoration planting at downstream end on southern side
- Birds of note: mallard, paradise shelduck, pukeko, welcome swallow
- Fish (NIWA): shortfin eel, longfin eel
- Cultural landscape includes rock art, rock shelter, nohoanga, pā (fortified place)
- A highly significant site

### Perceived threats

- It is a working farm
- Permission is required to access
- Since 2000 this place has been destroyed. "I am sad cos I saw it pre cows"
- Contamination from farming
- Risk of grazing within fenced area



**Figure 5. Cultural health assessment of Takiroa Wetland** (Tipa and Associates, 2015)

### Values and Opportunities sought

- This area is to be abundant with watercress
- Tuna are present. There is to be no harvesting
- Raupō and harakeke is to be present and good quality. It is valued as a pā harakeke. Restore access for cultural use
- Deep water channel is to be maintained
- The sound of birds – unseen but heard. Populations are to be protected
- Springs at the base of the terrace that feed the stream are to be protected
- Manage the stream and wetlands as a native fish reserve
- Good water quality is to be maintained
- Mix of wetland, stream, and springs is to be protected
- The appeal of the wetland is its proximity to Takiroa. The cultural landscape is to be protected
- Better fencing is to be erected. Stock are to be excluded
- The land between the wetlands and road should be retired
- Flows need to:
  - protect connectivity – 1) springs, wetlands and streams; 2) Stream to the mainstem Waitaki
  - allow restoration of the wetland/riparian vegetation/along the drainage channels

Site Status A-1 | Cultural use 3.5 | Health measure 3.5

This is a site of traditional significance that still sustains the cultural, beliefs and practices for which it is valued. It has above average mahinga kai value (on a 1-5 scale) and is rated above average in terms of stream health using 8 indicators assessed by mana whenua (indigenous people with primary rights and responsibilities over an area).

Looking upstream from the bridge below Takiroa





## DETERMINING THE RANGE OF INITIATIVES NEEDED TO DELIVER OUTCOMES SOUGHT BY WHĀNAU

It must be stressed that undertaking assessments and collecting data are not the outcome. The data gathered need to be interwoven to inform the development of responsive restoration strategies that simultaneously consider species, habitats, access, learning opportunities, retaining cultural practices, and mitigating impacts:

- Understanding the significance of a **species** to tangata whenua and its historic range allows the identification of possible sites to be restored and, if necessary, sites to which species could be reintroduced. See Table 1 for some examples of initiatives underway for species historically found in North Otago.
- Restoration of species depends, in part, on the restoration of their **preferred habitats**. A number of strategies are being implemented across North Otago that will protect and restore valued aquatic habitats, such as Takiroa (see photo bottom of next page). The cultural landscape at Takiroa includes rock art, shelters, nohoanga, pā harakeke, trails, multiple springs, wetlands, and many taonga species (plants, fish and birds).
- Use of the sub-catchments in the Waitaki River catchment by Ngāi Tahu depends on access to the river, and specifically to those sites whānau prefer to use. This has led to Ngāi Tahu negotiating with agencies and landowners for improved access. An example is one landowner 'opening up' a 2-kilometre reach of a waterway valued as a mahinga kai.
- Engagement in mahinga kai practices created opportunities for experiential learning in which **knowledge of ecosystems, species, and cultural practices and protocols** was shared. If mahinga kai is to remain an integral part of Ngāi Tahu cultural identity, the need to source a variety of data (of different media including photos, paintings, survey maps, mental maps, journals, diaries, and catch histories for species, etc.) to complement the knowledge still held within whānau and hapū is reinforced. This has led to the implementation of a programme of regular hīkoi (walks) and wānanga (learning). Taihoro Nukurangi–NIWA has been a key collaborator in many tuna management initiatives and has facilitated tuna wānanga across New Zealand. As part of the programme, a comprehensive resource on the freshwater fish species of the Waitaki has been prepared for the Waitaki Tuna Wānanga.
- To understand ecological knowledge one must participate in the processes of hunting, fishing, gathering, and processing of kai, for example, whānau have expressed a desire to learn how to extract specialty foods. Wānanga play a vital role in **retaining cultural practices**.
- When faced with significant resource consent applications, the papatipu rūnanga have prepared Cultural Impact Assessments to inform their interaction and negotiations with developers to **mitigate impacts**.

Looking downstream from the bridge at Takiroa



**Table 1. Taonga species historically taken from North Otago and restoration actions underway**

Taonga Species	Restorative Actions	Collaborations
<b>Tuna</b>	<ul style="list-style-type: none"> <li>• Prioritised fish passage as an issue:               <ul style="list-style-type: none"> <li>- Trap and transfer of elvers and relocate above the Waitaki dam</li> <li>- Trap adult migrants and relocate below the dams</li> </ul> </li> <li>• Prioritised protection of riparian wetlands</li> <li>• Identified and secured aquatic sites to enhance</li> <li>• Wānanga held to introduce whānau to mātauranga and science of tuna</li> <li>• Advocated for flow and allocative regimes that maintained connections between mainstream, tributaries, wetlands, etc.               <ul style="list-style-type: none"> <li>- Flow regime in two rivers modified</li> <li>- Allocation limits set in two rivers, and clawed back in another</li> <li>- An allocation for mahinga kai proposed in regional plan</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Meridian Energy Ltd</li> <li>• NIWA</li> </ul>
<b>Weka</b>	<ul style="list-style-type: none"> <li>• A weka reintroduction programme has been initiated in Otago. The benefits of this programme to Ngāi Tahu whānau are being monitored</li> </ul>	<ul style="list-style-type: none"> <li>• Department of Conservation</li> <li>• Te Rūnanga o Ngāi Tahu</li> <li>• Private landowners</li> </ul>
<b>Koarearea (raupō)</b>	<ul style="list-style-type: none"> <li>• A wānanga is planned to trial the process of extracting and using the pollen</li> <li>• Wetlands to be protected as a pā raupō were identified and agreement reached with the landowner</li> </ul>	<ul style="list-style-type: none"> <li>• Private landowners</li> </ul>
<b>Harakeke</b>	<ul style="list-style-type: none"> <li>• Secured a pā harakeke and initiated restoration (removed exotics, sourcing and growing seeds)</li> <li>• Using seeds from the pā harakeke to re-establish the cultivar elsewhere</li> </ul>	<ul style="list-style-type: none"> <li>• Private landowners</li> <li>• Meridian Energy Ltd</li> <li>• University of Otago</li> </ul>
<b>Indigenous fish</b>	<ul style="list-style-type: none"> <li>• Relocations of taonga native fish species to other catchments have been trialled</li> </ul>	<ul style="list-style-type: none"> <li>• Department of Conservation</li> </ul>
<b>Indigenous plants</b>	<ul style="list-style-type: none"> <li>• Restoration plans are being implemented at a number of sites</li> <li>• Whānau engagement in planting days</li> </ul>	<ul style="list-style-type: none"> <li>• Landcare groups</li> <li>• Private landowners</li> </ul>

The cultural landscape that encompasses the Takiroa Wetland (white box). Photo: New Zealand Aerial Archaeology



A key step for whānau is to assess their capacity to engage in restoration, which ultimately dictates their role and the extent to which they will lead a particular initiative. For example, having noted that land-use change and land use intensification are of concern to

Ngāi Tahu, Te Rūnanga o Moeraki has committed to a relationship with one of the irrigation companies in North Otago via a negotiated consent process (summarised in Table 2).

**Table 2. Some of the agencies with which Te Rūnanga o Moeraki engages to restore aquatic habitats across its takiwā**

Agency	Location	Formalising the relationship
Meridian Energy Ltd	Waitaki Catchment Rock art across North Otago	Te Rūnanga o Ngāi Tahu and the three Waitaki rūnanga are signatories to a Relationship Agreement
Department of Conservation	Across North Otago	Te Rūnanga o Moeraki is one of four rūnanga in Otago that has a Memorandum of Understanding (MOU) with the Department
Irrigation Company	Waiareka Creek	Te Rūnanga o Moeraki has a MOU with one company
Irrigation Collective	From the Kakaunui River to the Waitaki River	This is yet to be formalised. A working relationship is evolving
Forestry Company	Trotters Creek to Waianakarua River	The relationship has grown since an encumbrance was placed on the forestry land in 1998
Private Landowners	Across North Otago	This is often a personal relationship that is not formalised in an agreement
University of Otago	Across North Otago	Te Rūnanga o Ngāi Tahu has a MOU
NIWA	Across North Otago	Te Rūnanga o Ngāi Tahu has a MOU
Environment Canterbury	Waitaki	Te Rūnanga o Ngāi Tahu has a MOU



Whānau members electric fishing during an assessment of Maryburn in the Upper Waitaki. Photo: Gail Tipa

## MONITORING, REPORTING, AND COMMUNICATING RESTORATION SUCCESS

At the end of the day, whānau want to know if restoration endeavours are making a difference. This is inevitable, given that environmental restoration requires substantial effort and commitment. However, the long-term monitoring and evaluation programmes are able to capture and communicate improvements in economic, environmental, cultural, and social value-sets are generally not a priority component of such work programmes.

Many marae (Māori social and cultural centre), hapū (subtribe), and iwi (tribe) not only wish to contribute to fulfilling their own responsibilities as kaitiaki (guardian), but also wish to mainstream regional and national policy, monitoring, and planning. However, many groups are hampered by access to information, such as client reports produced for industry, water quality/quantity monitoring data, pest management plans, aerial photographs, and spatial data.

Environmental report cards are increasingly being promoted as effective public communication and engagement tools, and when used effectively, galvanise commitment and action. A report card assessing the Cultural Health of the Waitaki River catchment has recently been prepared in collaboration with whānau.

The presentation of a report card is important as it can directly impact its ability to communicate key messages. Colour can be used to quickly communicate ecological health, for example, the 'stop light' approach, where green is interpreted as 'go' or 'good', while red means 'bad' or 'stop'. Many combinations of numbers, colours, symbols, and graphics can be used when producing a report card. Using restoration as a learning context, posters are being used to convey information about the health of the catchment to whānau. These posters have been prepared for the marae.



A whānau member during an assessment of Temple Stream in the headwaters of the Waitaki catchment. Photo: Gail Tīpa

## SUMMARY

This case study presented an integrative planning framework that is enabling a rūnanga to move beyond reacting to environmental issues and instead to position them to manage lands and waters proactively within their takiwā. It is a relatively simple process of engagement that relies on the recording of the historic, current, and ideally, future experiences of tangata whenua. It provides a level of specificity that enables more effective collaboration with scientists, managers, resource users, groups, and landowners. It also provides a context within which to monitor implementation. The focus on providing "opportunities" is deliberate.

This case study also illustrates how it is possible to reconstruct the past and provide descriptions of the history and life ways of Māori, the changes they have experienced over time, the consequent impact of these changes on whānau and hapū, and how these have shaped contemporary behaviours. Such reconstructions help explain why particular landscapes and resources remain of particular cultural significance, and are the focus of restorative initiatives today.

Lower Waitaki River. Photo: GNS Photo Library



## WANT TO LEARN MORE?

Note: If you are having problems with the hyperlinks below, try copying and pasting the web address into your browser search bar.

### References

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### Useful website

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Meridian Energy. Discover Waitaki. <https://www.meridianenergy.co.nz/assets/About-us/Our-power-stations/Hydro/Waitaki/Discover-Waitaki-12.14.pdf>

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